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SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE.

February 24, 1940

Wings for Skiers

See Page 120

A SCIENCE SERVICE PUBLICATION

Do You Know?

In matching bells, some makers consider not only tones and overtones but also "personality."

A new life jacket automatically turns on its own distress signal light when the jacket—with the wearer inside—is immersed in water.

Athens College in Alabama will start a hosiery mill in which 400 students will work part time to meet their college expenses.

Spanish calves brought to America in 1521 founded the huge herds of millions of longhorn cattle that once roamed Western plains.

Hidden under plastering, large frescoes done in the fifteenth century have been detected in church buildings at the village of Brunello, Italy.

The earliest known example of canned food is in London, in a glass tube containing roast veal taken from a can more than a hundred years old.

Efforts to restore the Florida Everglades are being initiated by conservationists, who say that 25% of the area has been almost ruined for agricultural use by fires.

An early gas mask invented by an Englishman about 1825 had a leather hood, with mica or glass introduced for visibility, and a flexible leather pipe projecting from the nose to a flared tin opening equipped with filter and moist sponge.

A machine for measuring the warmth of fabrics used in clothes and bedding has been devised.

Germany plans to treat at government cost all children suffering from rickets—the number needing treatment being figured at 1,500,000.

Romans did not mark white lines on highways to divide traffic lanes, but they used wooden blocks as permanent markers down the middle.

Liege, Belgium, has been called the Thermopylae of Europe, because of its defensive position.

The white pine blister rust is reported to be advancing 80 miles farther south through California's sugar pine forests each year.

An Illinois experiment showed that when corn was not cultivated and weeds grew freely, the corn yield was reduced about 80%.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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SCIENCE NEWS LETTER

Vol. 37 FEBRUARY 24, 1940 *No. 8*

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 2101 Constitution Avenue, Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienserve, Washington.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER at $3 a year.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and Journalistic profession.

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CHEMISTRY

Glycerine Made Synthetically Expected to Stabilize Price

Long Sought in Vain by Chemical Industry, It Is Now Available from Petroleum; Made from Cracked Gas

SYNTHETIC glycerine, a product long sought in vain by chemical industry, is now available from petroleum. Recent technical reports to the American Chemical Society by Dr. Evan C. Williams, Dr. H. P. A. Groll and G. Hearne, of the Shell Development Company, Emeryville, Calif., show how unlimited quantities of the compound can be made from cracked gasoline.

Glycerol, as the chemist prefers to call glycerine to show its family relation to alcohol, has ever been the victim of fickle market conditions, since it is a byproduct of rather fixed quantity from the soap industry. A change in demand, as occasioned by war conditions or peace treaty, does not affect supply and thus prices skyrocket and dive most inconveniently. Figures from 9 to 70 cents per pound have been quoted since the World War. During the one year 1938 the price dropped nearly 60%.

Although glycerol is a simple organic compound, its molecular structure, with one atom of oxygen attached to each carbon atom, has baffled the synthetic manufacturer who must use processes of low cost. By allowing chlorine to react upon propylene, a gaseous component of cracked petroleum, the California technologists have succeeded in producing at low cost the substance allyl chloride. From allyl chloride the compound trichloropropane is then readily prepared. The molecule of trichloropropane is similar in structural design to that of glycerol, and the product is readily convertible into glycerol with the aid of cheap alkali.

Less Unpleasant

The new synthetic glycerol has been tested in gross quantities in the stomach, with effects even less unpleasant than those from the pharmaceutical grade of natural glycerol. Being identical in composition, the preparation needs attention only to purity standards, and this question is easily solved.

It is suspected that much more of interest is in view than a mere stabilization of price and strategic war supply for use in a possible time of siege.

By combination of glycerol with acids, a remarkable array of valuable oils is possible. These compounds are analogous chemically to olive, cotton and linseed oils, but without the narrow restrictions in quality and quantity imposed by nature in plant growth.

Superior Lubricants

From petroleum it is likely that entirely new acids, perhaps those with molecules in bunch-like form instead of the chain form normally followed by plants and animals, may be available for this field of research. From such syntheses it is possible that lubricants superior to castor oil, and paint vehicles ahead of linsed oil, might be discovered. The castor and linseed products are glycerol-acid compounds of the type in question. Furthermore, the resin industry is interested in the prospect of cheap glycerol, which with complex acids forms very complex derivatives suitable for use as plastic resins.

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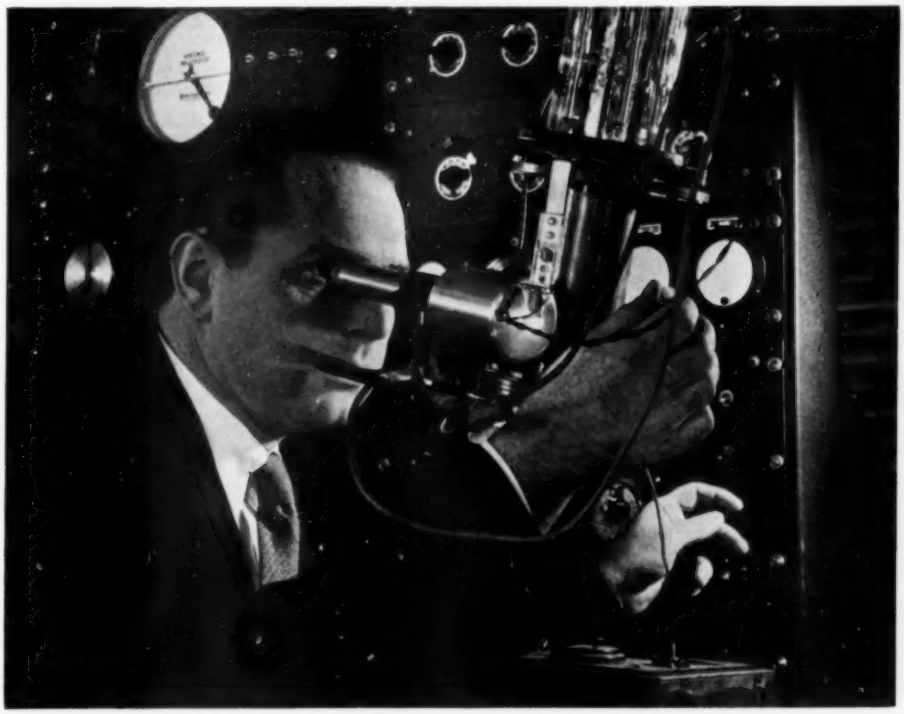
ENGINEERING

New Dams Bring Northwest America's Cheapest Power

THE GRAND Coulee and Bonneville dams will bring to the Pacific Northwest region of the U.S.A. America's cheapest commercial electric power, costing from 1½ to 2 mills per kilowatt hour (a mill being a tenth of a cent.) Here is energy for a new industrial development utilizing the large deposits of raw material and cheap tidewater transportation in connection with the inexpensive electricity.

Research workers in mining, metallurgy and geology, both State and Federal, centered at Washington's State College at Pullman are exploring vigorously new manufacturing industries capable of using the new electrical power.

Most promising are developments that make production of manganese metal and magnesium metal of high purity, practical at low cost. Most exciting is a new and simple direct method of



YARDSTICK FOR ATOMIC ENERGY

Dr. William H. Wells, in charge of the giant electrostatic atom smasher at Westinghouse, measures the energy of the atomic bullets with the aid of this little electroscope.

large-scale production of the light-weight metal magnesium, only 2/3 as heavy as aluminum and ¼ as heavy as iron, from Washington State's magnesite deposits at a cost of possibly less than 8 cents per pound using the cheap Grand Coulee power. The present market price of magnesium metal made from salt brines in Michigan is 28 to 30 cents per pound. With lower prices for magnesium metal free from chloride inclusions it would be used more widely in airplane construction, railway cars, automobile and any sort of equipment that has to be transported as a dead weight.

Science News Letter, February 24, 1940

GEOLOGY

Huge Hole in Cuba Supplies Much of Nation's Manganese

DURING the Spanish-American War one of Teddy Roosevelt's Rough Riders kicked a piece of ore in Cuba and began a chain of events which today sees Cuba supplying a large share of the American steel industry's needs of strategic manganese.

The whole story of the Cuban manganese industry and its role in the economic fortification of the great American steel industry was told at the meeting in New York of the American Institute of Mining and Metallurgical Engineers by F. S. Norcross, Jr., engineer and president of the Cuban Mining Company.

Out of the kick of the Rough Rider's foot have come great holes in Cuba—the largest a half mile long and 1,000 feet wide—which are the strip mine pits where manganese ore is dug out of the earth.

Averaging from 17% to 18% metallic manganese in content, the Cuban ores are refined and concentrated to bring them up to ferromanganese grade for use in steel making which requires 48% manganese or better.

During the years from 1936 through 1938 the steel plants of the U. S. required about 736,000 tons annually of high grade ore from foreign sources. The 1938 Cuban production was 131,000 tons.

Science News Letter, February 24, 1940

MILITARY SCIENCE

Expansion in Naval Research In New Appropriation Bill

THERE is a new deal for research in the Navy and at the top of the pile and coordinating center in the new setup is the Naval Research Laboratory at Anacostia, just outside Washington.

Famed inventor Thomas Edison fathered the electric light, the phonograph and the new Secretary of the Navy, Charles Edison. And the same research spirit which fostered Edison's great inventions appears unwritten between the lines of testimony at committee hearing on the 1941 Naval Appropriations Bill which has just been reported to the House.

A greatly increased staff of scientists, new research equipment and buildings and a recommended budget increase of about $300,000 yearly for research expansions alone, are among the highlights of the report.

Key step in the new research shakeup has been the transfer of the Naval Research Laboratory from the Navy's Bureau of Engineering to the office of the Secretary of the Navy. This makes the research laboratory a peer of the Navy's other bureaus instead of a tolerated offshoot of the nation's nautical family tree.

Cold figures tell the story.

1940 budget for naval research	$370,000
1941 budget requested	$754,130
1941 budget recommended	$653,350
Net gain	over $283,000

Science News Letter, February 24, 1940

ARCHAEOLOGY

Here's One Wartime Saving; No $25,000 Suits of Armor

ONE thing is cheaper in modern war. No king, dictator, or general is inspecting troops in a suit costing $25,000.

A metal outfit which cost a 16th century French king—or his subjects—somewhere around this fabulous sum has been acquired by the Metropolitan Museum of Art in New York. The harness, as armor experts call such a metal suit, is complete from closed helmet to steel shoes, and almost every inch is richly ornamented. Curator of Armor Stephen V. Grancsay suspects that the man who wore it was King Henry II.

The suit cost as much as a military campaign, comments Mr. Grancsay.

Never intended to stand fighting wear, the harness shows America a military dress suit de luxe, of the days when armor was really ornate.

"It was made," says Mr. Grancsay, "to

FIT FOR A KING

Estimated to have cost $25,000, this royal armor shows what a well-dressed 16th century French king wore when he appeared in public after a battle. It is the only complete embossed armor in America. Europe has only five equal to it.

DETAIL

This closeup shows the intricate pattern of the royal embossed armor shown on the facing page.

be worn after the battle to enliven the spectacle of a state entry."

Cost of the outfit is judged from facts known about fees and labor in the medieval armor industry. Three thousand gold crowns was what Philip II of Spain paid to an armorer who made him a similar harness. And Mr. Grancsay figures that both the designer and the artist who embossed and damascened the intricate decorations must have received like sums.

Armor of a strictly business style is having a revival in modern fighting togs, though not to the extent of complete head-to-foot gear. Chief handicap of modern armor, even bullet-proof kinds, is that it is not shock-proof, Mr. Grancsay thinks. If someone could develop a practical shock-proof armor, now, that might be very useful.

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●RADIO

Superintendent Paul Gossard, of the Bloomington, Ill., public schools, Prof. John J. Lee, director of special education, Wayne University, Detroit, and Principal Paul L. Essert of the Emily Griffith Opportunity School, Denver, will take part in a discussion of opportunities for exceptional children, interviewed by Belmont Farley, director of publicity, National Education Association, on "Adventures in Science" with Watson Davis, director of Science Service, over the coast to coast network of the Columbia Broadcasting System, Thursday, February 29, 4:15 p.m., EST, 3:15 CST, 2:15 MST, 1:15 PST.

Listen in on your local station. Listen in each Thursday.

METALLURGY

West Coast Steel Industry May Come From Discovery

Monopoly of Pittsburgh and Other Eastern Cities May Be Broken by Metallurgical Coke from Wood

A GREAT steel industry for the Pacific northwest sounds fantastic to those who know the present geographical monopoly of Pittsburgh and other eastern and southern steel centers, but inventive genius and engineering skill have combined to bring near a realization of what was once only a dream.

To make steel you need cheap fuel for the blast furnaces, metallurgical coke, limestone and iron ore. Only in limestone could the West Coast meet these requirements if present day standards of steel-making still existed.

As the great hydroelectric projects of the Federal government in the northwest come into being at Bonneville and Grand Coulee, foresighted men have realized that cheap electrical power might make possible electric counterparts of Pittsburgh's blast furnaces. But like the man who, if he had the ham could have ham and eggs, if he had the eggs, cheap electrical power and limestone alone could not produce a West Coast steel industry much as it might be desired from a military, strategic, decentralized standpoint. There was still the need for coke and the need for iron ore.

The iron ore of the west lacks the richness and easy transport facilities by water which make the Lake Superior region dominant in this field. But it is known that 916,000 gross tons of ore were mined and shipped from the west last year with a dollar value of $1,507,000.

This tonnage, however, is only a drop in the bucket for a man-sized steel industry. To supplement the deficiency the visionaries planning a steel industry for the west coast note that over two and a quarter million tons of iron ore were imported in 1939 for the American steel industry. Two-thirds of this vast tonnage came from Chile via the Panama Canal to eastern seaports. For less transportation cost, it was calculated, this iron ore could be taken on up the Pacific to Puget Sound ports.

That figuring, in a sense, supplied the ham for the ham and eggs but it still left the eggs. The non-existent eggs of the old joke is the non-existent metallurgical coke in the West.

What may be the answer to the missing coke for the now non-existent western steel industry has just appeared in a new patent, No. 2,184,317, awarded to Stevan Ruzicka of Beograd, Yugoslavia.

Dr. Ruzicka may not, just now, be a widely known man but his older brother is Prof. Leopold Ruzicka who, last year, won the joint award for the 1939 Nobel Prize in chemistry.

The younger Ruzicka has been in the United States since 1935 perfecting a way to make a sturdy metallurgical coke out of wood. Woodcoke is the only name one can devise for his new discovery but the name, of course, is a combination of paradoxical terms, for real coke comes from the burning of bituminous coal.

What Dr. Ruzicka has done is to find a way to take the waste wood of the Pacific northwest, burn it to charcoal, grind it to a powder and then, by organic binders followed by reheating, he cements it into lumps the size of real metallurgical coke and of comparable structural strength.

He ends up therefore with a woodcoke which has all the desired purities of a charcoal. It is charcoal which has produced the world-famous, high-quality Swedish steels.

However, charcoal of itself is structurally weak and not adaptable to blast furnace operations where the coke is poured into the furnace with a great charge of limestone and iron ore that may weigh hundreds of tons. The new Ruzicka woodcoke, however, possesses the strength needed to adapt charcoal to American blast furnace operations.

The end of the story of the steel industry for the Pacific northwest is in the future, but the final ingredient for a successful industry appears at hand. From the northwest's wasted wood chips —and they are plentiful—can come the strong wood-coke needed.

The advantages of a western industry producing high quality steel would include proximity to the nation's center of the aviation industry and the possibility of a better steel for armor plate.

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CHEMISTRY

Work for New Fabrics

New Fibers of the Research Laboratories Do More Than Adorn; They Have Important Industrial Functions

By ROBERT D. POTTER

This is the second of a two-article series on those new fabrics of today and the future that are contributions of the scientific laboratory to more pleasant living. See SNL, Feb. 17 for article describing wool from milk and new cloths from rayon.

FIBERS and fabrics of the future by no means are confined to wearing apparel for usefulness. Hidden in the complex mechanisms of our modern age are fibers and fabrics which are seldom seen, but without which our splendid engineering and industrial machines could never function.

Metal fabrics stand guard in great radio stations shielding intricate parts from electrical interference with one another. Fibers of metals become electrical cables in modern automobiles and carry electrical current to millions of homes in the land.

Man's problems of cooling and heating are intermingled with glass "wool," and glass cloth is becoming a reality instead of a novelty.

Fibrous glass is the new marvel of the glass industry which already has turned out such diversified articles as giant telescope mirrors and baby's nursing bottles, not to mention heat-resisting glass frying pans.

Melted glass can be passed through tiny holes to form fine fibers that are smaller in diameter than a human hair. These glass fibers can be spun into threads and woven into cloth.

Not Yet for Clothing

Articles of clothing can be, and have been, made of glass for exhibit purposes but the day of glass clothing is for the future. However, glass fabrics are finding a multitude of uses without entering the apparel field.

Drapes and curtains of shimmering glass fabric are easy to keep clean, long wearing, moisture-proof, rot-proof, will take brilliant colors that never fade and —most important in public places—are fire-proof. The day may be coming when fabrics of glass will be used for upholstery on chairs in the public rooms of hotels, ships and theaters, as a fire-protection measure.

Because there are few common materials which have better electrical insulation properties than glass, fabrics made of this material are finding wide use in the vast electrical industry. Glass wool, too, is entering more widely into heat insulation with every advance of air conditioning. The "wool" is a fluffy material that weighs only a pound and a half to the cubic foot.

In Chemical Industry

Large sections of the chemical industry, also, could not exist without the use of glass fabrics and wool. These materials form splendid filters in chemical processes with acids which would attack paper and ordinary wool filters.

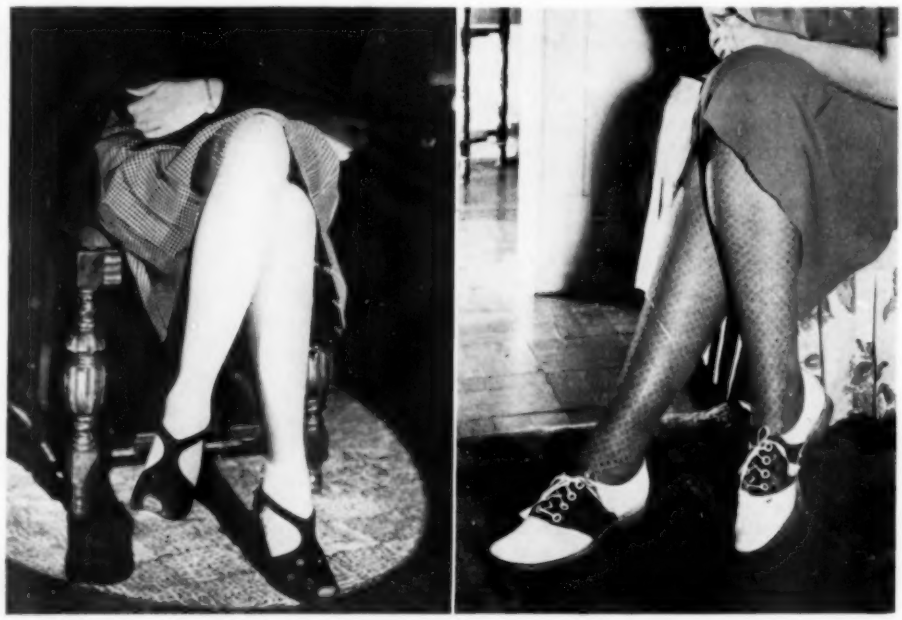
"Materials fabricated from glass yarn still do not have the softness and flexibility that we ultimately hope to obtain," reports Donald C. Simpson of the Owens-Illinois Glass Co. "At present the fibers are still too harsh for use as wearing apparel, or for purposes where they come in contact with the human body in any manner; nor are applications logical where excessive wear or flexing is necessary.

"Uses of fibrous glass cloth where there is a desire for permanence or a need for fire-proofness, acid-proofness, resistance to rot or decay are logical immediate fields for the introduction of glass textile materials, and it appears that a fundamentally new art is being developed."

Developing along with glass as a fiber of the future are the new uses for metal fibers and fabrics. "Cloth of Gold" is, of course, almost synonymous with royalty and the emperors of ancient Rome. But, while fibers of metal have a venerable antiquity, they have increasing usefulness in the present and will have in the future.

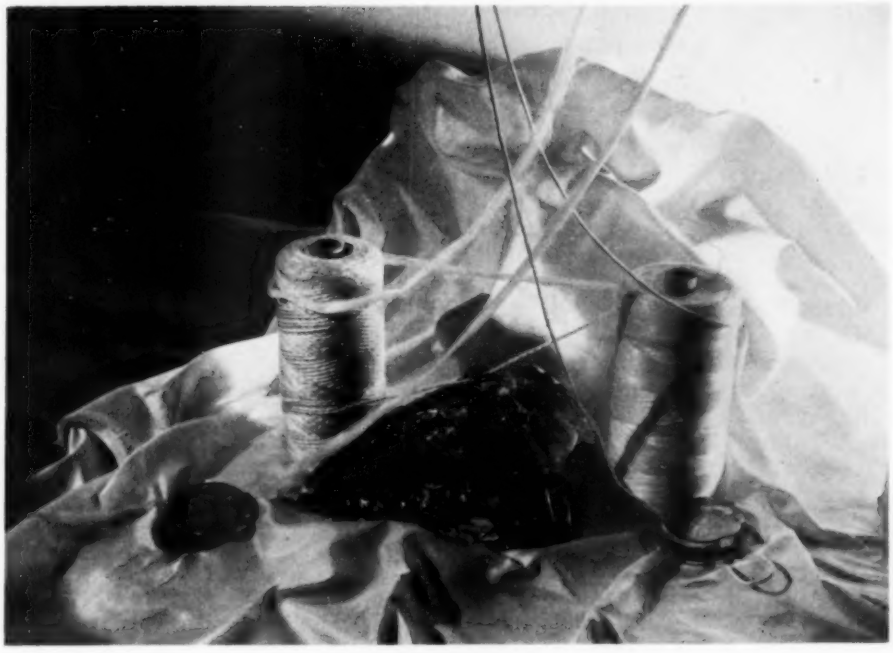
Metal Fibers

Metal fibers can now be drawn to extreme fineness and for the more expensive metals, like gold and silver, there are ingenious methods to produce textile fibers at low cost. Wires of gold may be merely gold plating on silver. Or silver wires may be silver plate on copper and so on.



DRESS *SPORT*

Research has provided new kinds of stockings to beautify a lady's legs. At the left are the new Nylon stockings which look like silk but wear longer. At the right are a new kind of cotton stockings that are suitable for golf or housework, but cling snugly to the leg as cotton stockings have not done before.



SILKY

But the material is cloth of glass on which rest the various steps in production of glass fibers and fabrics. The raw glass in the center is melted and made into fine glass fibers, strong as steel. These are spun into yarn and twisted into glass cords. The yarns are woven into cloth in the ordinary fashion to make fireproof theater curtains and upholstery.

Moreover it has been found possible to cover cores of cotton and other fibers with ribbons of metals and so provide the metallic appearance. Metallic dust, too, can be made to adhere to fibers with flexible adhesives. Transparent tarnish-preventing chemical coatings complete this process.

However, the bulk of the use of metal fibers is not in the textile trade for wearing apparel, but in the industrial field.

Face powder, medicinals, and flour are only a few samples among a host of commodities which are screened through sieves made of metal cloth.

Smaller Diameter

Metal fibers can be obtained in diameters smaller than any other fiber. The finest sieves, of 400 mesh, are woven out of wire that is only nine ten-thousandths of an inch in diameter. This is comparable with the dimensions of most spider-web filaments.

For single filaments of wire, platinum fibers of one ten-thousandth of an inch in diameter are now coming into use as the cross hairs of surveying telescope sights.

The length of metal fiber in metal cloth of the finer variety is truly amazing. For 400-mesh sieves, the wire is so fine that in a square foot of cloth there is about a mile of wire.

Chemistry, long known as the wonder worker of science, has had no more outstanding achievement in the last few years than the discovery of the way to make new synthetic fibers from coal, air and water.

Rival of Silk

Out of these common and abundant ingredients has come a fiber that is potentially a real rival of glistening silk; a fiber that promises to carry its commercial fight into the last remaining large market of natural silk, the hosiery field.

Known as nylon, this new synthetic material has already been woven into experimental stockings that approach that long-time dream of inventors everywhere; the dream of making a sheer two-thread hosiery that would have the wearing qualities of three-thread service weight hose.

If the significance of this dream is confusing to the men let them ask the next girl they meet what it would mean to the nation's sex appeal and also to its stocking budget.

If America can produce a synthetic fiber that will look better, wear better and cost no more than silk, the international repercussions in international trade will truly be important for the greatest single export of Japan to the United States is silk.

Nylon is the first material, suitable for use in the fiber field, which is derived from inorganic materials. All other synthetic fibers come from organic materials; materials derived basically from living things, plants or animals.

Nylon can be drawn out into threads which are finer than those of the silkworm, look and feel like silk and possess greater strength and elasticity. Moreover it matters little in the manufacturing process whether the fibers are extruded to this extreme fineness or whether they are made thicker.

For Toothbrushes

In fact, you may be today using a toothbrush whose bristles are made from Exton which is merely the trade name of synthetic bristles derived from nylon. The wetproofness of these bristles and their springiness, that denotes great elasticity, are to be found also in the finer fibers of nylon used in hosiery.

More than any great monument or memorial, nylon is a lasting tribute to a great chemist, now dead. That man is the late Dr. Wallace H. Carothers of E. I. du Pont de Nemours and Company who, only twenty days before his death in 1937, applied for the basic patents describing nylon and the ways of making it. (*See also* SNL, Feb. 17)

In patent No. 2,130,948, which will some day become historic, Dr. Carothers described eight distinct ways of making fibers out of compound chemicals known as polyamides. In his broad basic patent with 56 separate claims the du Pont chemist founded what will some day be a great new industry; an industry which already is having an $8,000,000 plant built for it that will employ 1,000 people.

Polyamides are chemicals that can be prepared from black sticky coal tar, obtained from the destructive distillation of coal. It is from coal tar too that chemists have already fashioned odors never known to nature, colors never before seen and countless important medicines of which aspirin is only one example among hundreds.

Polyamides are chemicals which in certain cases have properties like proteins, the basic molecules out of which foodstuffs and the human body are made.

When I searched through the new Carothers' patent describing nylon I was astounded to see that one of the ways of making silk stocking fibers was to use a polyamide that is formed naturally in the animal body after death. This material, whose name cadaverin is a hint as to its natural origin and evil-smelling prop- (*Turn to Page 124*)

OCEANOGRAPHY

Note from Liner Columbus Drifts to West Indies

A BELATED Valentine message, from a fine German ship now on the bottom of the ocean, is reported in the *Hydrographic Bulletin,* published by the U. S. Navy for the information of American seafaring men.

On Feb. 14, 1939, Officer K. Pfennig of the liner Columbus set adrift a sealed bottle containing an identifying record. A strange, strong thread of Columbian coincidence runs through the story of that drifting bottle. For it was put overboard near the Canary Islands, first stopping-point of Christopher Columbus on his great discovery voyage in 1492; and on Dec. 14, 1939, it was washed ashore on St. Kitts Island, which is one of the claimants to the title of Columbus' first landing-place on this side of the Atlantic, and is now a British possession. Borne by ocean currents, the bottle had drifted about 3,200 miles.

And in the meantime, the great ship from which this wandering messenger was launched, to drift slowly along Columbus' track, has become a victim of the new war between Germany and Britain. Threatened with capture, the Columbus was burned and scuttled by her own crew on Dec. 20, 1939, when her capture by a British warship seemed imminent.

Apparently not even a war can disturb the leisurely calm of a British West Indian official, for although the interesting bottle came ashore in mid-December, the news of its contents was not communicated to the Hydrographic Office of the U. S. Navy until mid-February.

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PHYSIOLOGY

Man is Longest-Lived Mammal, Studies Show

LONGEST-LIVED among mammals is man himself, it is indicated by Maj. Stanley S. Flower, British zoologist who has collected data on this much-discussed subject for many years. Centenarians are found with increasing frequency nowadays, Major Flower states in the current issue of *Fauna,* and he has one apparently authentic record of a human being reaching the age of 114 years.

The elephant, which was long supposed to top man for age, is an exceptionally long-lived animal even though its oldest veterans fall a couple of years short of the half-century mark. Other long-lived big animals in Major Flower's records are a rhinoceros that lived to be more than 40 and a hippopotamus that reached the age of 41 years and 6 months.

Size, however, has no necessary connection with age: figures for lion, tiger and domestic cat are 25, 19 and 20 years, respectively. Record age for a captive gorilla is 13 years, for an animal still living at the Philadelphia Zoo, while a little Cebus monkey nearly doubled that figure, dying at 25.

Ages of 500 years and more, claimed for turtles and tortoises have proved to be exaggerations. However, there are apparently authentic records of tortoises reaching ages of 125 and 152 years, and a somewhat less dependable figure of 123 years for a common box turtle. Outside the turtle family, reptilian ages are not extraordinary.

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AGRICULTURE—ENGINEERING

Iowa Tall Cornstalks Used as a Snow Fence

A NEW use for cornstalks after they have done their botanical bit in producing ears of corn: As a natural snow fence. In Black Hawk County, Iowa, road authorities asked farmers to pick by hand the ears from 20 rows of corn next to the road leaving the stalks in place to trap the snow as much as 100 feet back from the road. Snow plowing costs have been greatly reduced.

Science News Letter, February 24, 1940

BOTANY

Find Laziness in Corn Is Hereditary Defect

LAZY CORN, that sprawls flat on the ground instead of standing erect, is given a physiological explanation (*The Botanical Gazette*) by Dr. John Shafer, Jr., of Cornell University.

If a normal cornstalk (or any other plant) is laid horizontally, about 60 per cent of its auxin, or growth-promoting hormone, becomes concentrated on the lower side, making that side grow faster and causing the stalk to curve upward into normal position again.

In lazy corn this condition is reversed. The plant perversely concentrates 55 per cent of its hormone on the upper side of the stalk, keeping it prostrate.

Laziness in corn is a hereditary defect. Such corn is of course useless for practical purposes and is grown only as a curiosity and for purposes of scientific experimentation.

Science News Letter, February 24, 1940

IN SCIENCE

INVENTION

Sweeping Cloaks Are Used To Give Skiers Stability

See Front Cover

SWEEPING cloaks that the "Phantom of the Opera" might have enjoyed are the newest trick for ski enthusiasts invented by Prof. Hans Thirring of the University of Vienna. Looking like sails the ski cloaks act, however, in a reverse way. They are not designed to make one go faster, but rather to obtain greater stability.

They are designed for the great middle class of skiers—neither the expert nor the complete novice. The former can maintain their equilibrium with their arms and the latter never attain speeds sufficient to bring the stabilizing effect into action.

Prof. Thirring was led to his invention by the knowledge that at the end of a ski run, when the speed gets faster, there comes a time when one feels safer than at slower speds. The body seems to rest on air. By maneuvering the cloak it is possible to obtain this effect of extra stability more easily. One might compare the invention with the balancing bar which a tight rope walker carries to keep equilibrium.

Science News Letter, February 24, 1940

PHYSIOLOGY

Museum of Health Vouches For These Health Facts

HEALTH facts authenticated by American Museum of Health exhibits: An area about the size of a penny on each side of your nose allows you to smell. The normal human ear is capable of receiving sound waves of 16 to 16,384 vibrations per second. The average healthy grown person's body has 25,000,000,000,000 red blood corpuscles, 30,000,000,000 white corpuscles and 1,250,000,000,000 platelets. The human skeleton has 245 bones. Swimming develops your lung capacity more than any other activity. The typical person breathes 7.03 quarts of air per minute while resting flat on the back, 45.46 quarts while swimming.

Science News Letter, February 24, 1940

E FIELDS

ETHNOLOGY

Skis a Lapp Invention, Ethnologist Suspects

SKIS on which Finland's soldiers speed over snowy battleground were invented right up in that part of the world, by ancient Lapps. So thinks a Smithsonian Institution ethnologist, Herbert W. Krieger, who has trailed a good many inventions into the shadowy past.

When, and exactly where in the Arctic, the Lapps first felt the thrill of skimming along on skis, nobody can say, explains Mr. Krieger. Lapps over-lapped from Scandinavia to Russia, and their country has been little investigated by archaeologists. But Lapps have used skis a very long time. Lapps have a reputation for being averse to violence; and we may picture early ski-experts engaging in peaceful travel. In warfare, skis have been used for several centuries.

Russians, who are now bringing Siberian troops into the fight against the Finns, are drawing these men from a region familiar with old-fashioned Arctic travel methods. In Siberia, snowshoes shod with seal fur have a long history. To an ethnologist, it looks as though Russia overlooked a bet when she stressed mechanized warfare to the neglect of the Arctic's time-tried horse-and-buggy means of getting over ground.

Some medieval Norse skis were made one longer than the other, the longer being for gliding and the shorter for climbing. The shorter one was fur-covered to provide a brake.

Science News Letter, February 24, 1940

MEDICINE

Phenothiazine Found Useful in Veterinary Medicine

A CHEMICAL related to sulfanilamide, known as phenothiazine, has been found highly effective in the treatment of several species of parasitic worms in livestock by scientists of the U. S. Department of Agriculture. As soon as manufacturers make suitable application to the Secretary of Agriculture, it will be released as an accepted veterinary medicine.

Phenothiazine first came into scientific notice half-a-dozen years ago when it was found to be highly toxic to insects and very slightly so to warm-blooded animals. This original research was carried out by L. E. Smith of the Bureau of Entomology and Plant Quarantine. Investigations since then have led Department of Agriculture scientists to believe that it is one of the most versatile chemicals brought to light in recent years.

In addition to its effectiveness against insects, worms and other cold-blooded forms of life, phenothiazine has been found to have marked fungicidal and bactericidal properties. In the latter field, it has been used as an internal antiseptic in human medicine, in the treatment of cystitis, pyelitis and allied diseases.

Researches on the use of phenothiazine in human medicine have been conducted by Dr. Floyd DeEds of the Stanford University School of Medicine, to whom a public service patent on this phase of its applications has been granted.

Science News Letter, February 24, 1940

PHYSIOLOGY

Females More Thrifty Even In Utilization of Iron

THE CHARACTERISTIC difference between the prodigal male and the thrifty female holds good even for the way anemic bodies of the two sexes use iron for blood-building, latest scientific researches seem to show.

When an anemic female is fed only a tiny amount of iron—a time when most economical use of the iron is of vital importance — she actually retains more iron than the male, in spite of her smaller body size. This and other facts showing a sex difference in utilization of iron were learned from studies made by Drs. Louise Otis and Margaret Cammack Smith, of the University of Arizona (*Science*, Feb. 9). The studies, to be sure, were made on male and female rats, but these small laboratory animals are much like humans in their nutritional requirements.

The rats had their iron reserve supply depleted by an exclusive milk diet. Then rats of both sexes were fed the same amount of iron. The females showed their thrift by their greater gain of hemoglobin (red coloring matter of the blood) and when the iron content of their bodies was determined, the amount of iron per gram of rat was always higher for females than for males fed the same amount of iron.

Science News Letter, February 24, 1940

CHEMISTRY—FORESTRY

Chemistry Aids Lumber Against Natural Enemies

CHEMISTRY is coming increasingly to the aid of wood as a building material, protecting it from natural enemies and defects that have militated against its use, L. F. Livingston of E. I. du Pont de Nemours and Company told the American Forestry Association at Biloxi, Miss.

Chemical treatment is becoming of particular importance as the proportion of second-growth wood in the lumber supply increases, Mr. Livingston pointed out. Second-growth wood will do the work demanded of it as well as lumber cut from virgin timber stands, but its greater porosity gives enemy organisms, particularly fungi, easier opportunity to enter and spread.

Outstanding accomplishments of chemical treatment of lumber, as outlined by the speaker, have been the stopping of the spread of stain fungi through the use of mercury and chlorophenol compounds, the overcoming of the tendency to "check" in seasoning by means of moisture-attracting chemicals such as invert sugar and synthetic urea, and present hopeful progress toward the solution of the problem of swelling and shrinking, with resulting aggravations of jamming doors, sticking drawers, warping tables and rattling windows.

Science News Letter, February 24, 1940

RADIO

Instrument Enables Blind To Do Radio Servicing

PIANO TUNING has long been a successful vocation for those who cannot see. Now, thanks to a new instrument developed by radio instructor Charles G. Barany of Baltimore's Boys Vocational School, No. 293, and called the videlyzer, those with the handicap of blindness may very well become efficient radio servicemen.

When a blind boy came into his class, Mr. Barany worked out a radio circuit analysis instrument on which meter readings could be made by feel through use of the fingers instead of the eyes. Circuit diagrams were prepared in lines and symbols raised above the surface of the paper so they also could be read by feel. Successful use of the new instrument by blind technicians gives hope that other handicapped persons can take up this necessary work in a modern world despite their loss of sight.

Science News Letter, February 24, 1940

ASTRONOMY

Planets Still Bright

By the Fifth of March, However, Elusive Mercury Will Disappear in Sun's Light; Spring Is Coming

By JAMES STOKLEY

THE unusual display of the planets which is seen in the western evening sky at the end of February will still be visible on the first few evenings of March.

Soon after sunset, Mercury is seen near the horizon. Higher, and brighter, is Jupiter. Above him, brightest of all, is Venus. Then comes Saturn, which is fainter, and then Mars, the faintest of the five. Thus, all of the planets which are ever visible to the unaided eye are seen at once (*See SNL, Feb. 17 for map.*)

However, even at the first of March, Mercury will be approaching the sun. By about the fifth of the month it will set so soon after sunset that we cannot see it. About March 12, however, the crescent moon will be among the four that remain, making a most striking spectacle.

Jupiter and Saturn, as well as Mercury, go down too soon after the sun to be shown on the accompanying maps, which give the sky's appearance later in the evening: at 10:00 p.m. on March 1, 9:00 p.m. on the 15th and 8:00 p.m. on the 31st. Mars and Venus, however, are shown in the constellation of Aries, the ram.

The planets are like the earth, part of the solar system of bodies revolving around the sun. The stars are distant suns, each a glowing globe of gaseous matter, and arranged into the familiar constellations. To the southwest is the bright group of figures which make the evening skies of winter and early spring so brilliant. Orion, the great warrior, may be identified by the row of three stars forming the belt. To his right, high in the west, is Taurus, the bull, with ruddy Aldebaran to mark the eye. To the left of Orion, and lower, in the southwest, is Sirius, the dog star, part of Canis Major, the great dog. Sirius is the most brilliant star to be seen at night. It is really not very bright, however, but appears so because it is quite close.

Above Canis Major is Canis Minor, the lesser dog, with Procyon. Almost overhead is the figure of Gemini, the twins, with Castor and Pollux. The latter, to the south, is the brighter. High in the northwest is Auriga, the charioteer, with brilliant Capella.

To the southeast is Leo, the lion, in which is found a smaller group called the sickle. Regulus, the bright star at the end of the handle of the sickle, forms the lion's shoulder. Around to the northeast is the ever-familiar great dipper, part of Ursa Major, the great bear. Cassiopeia, the queen on her throne, is in the northwest, and between this and the dipper is the pole star, which itself is in the little dipper, or the little bear, Ursa Minor.

The earth has many motions. Not only does it turn on its axis and give us alternation of light and darkness from which we get the period called the day, but it also revolves around the sun, and this motion times for us the year. Since the stars, though bodies like the sun, are so much farther away, we see the sun at different times of year against a different background of stars. That is, we would see it if the stars near the sun were visible, as they are, indeed, at the time of a total eclipse of the sun.

Because the axis of the earth is not at right angles to the plane in which it travels about the sun, at one time the north pole, and the greater part of the northern hemisphere, is tilted toward the sun. Then, in the northern hemisphere, the sun is high, and we have summer. When, six months later, the south pole is tilted toward the sun, it is summer in the southern hemisphere and winter in the northern hemisphere.

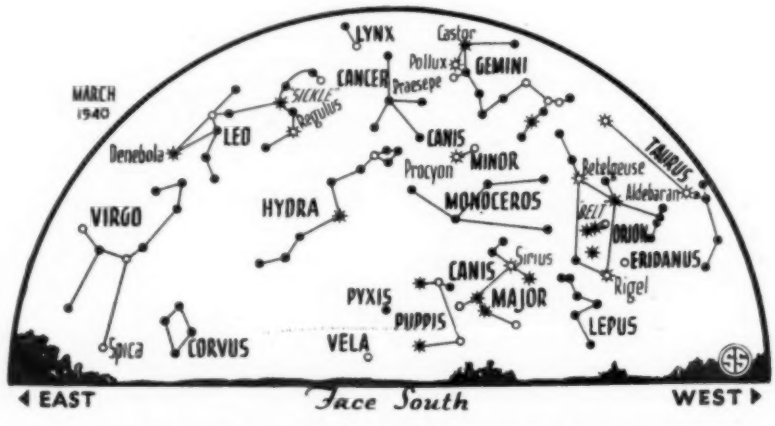
Halfway between these positions, each pole is the same distance from the sun, which is then directly over the equator. Since, at these occasions, day and night are approximately equal, we call these the equinoxes.

The vernal equinox is the one that occurs in March, which, in the northern hemisphere, marks the beginning of spring. It used to mark the beginning of the year also. In England, before the Gregorian calendar was adopted in 1758, this was the case, and the same year number was used in January and February as they had used in the previous December. Thus, we celebrated the 200th anniversary of George Washington's birth in 1932, but at the time he was born, his neighbors and family would have told you the year was 1731.

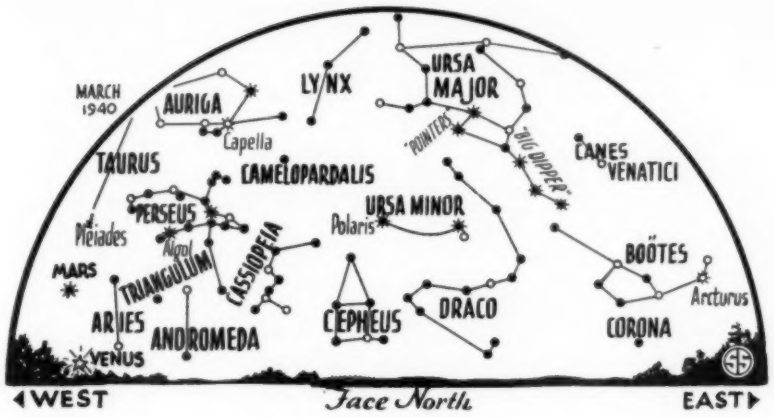
Since the time of the vernal equinox marks the reawakening of nature after it has been sleeping during the winter, early man regarded it as most important. Among the Saxons, this time of year was dedicated to Ostara, the goddess of spring. Our word Easter is simply a corruption of her name.

The Jewish Passover also was originally a springtime festival. Their calendar was, as it is now, a lunar one, and they celebrated it during the month of Nisan, the first of their ecclesiastical year. This, like all their months, begins with a new moon; in this instance it is the one on or soon after the vernal equinox. Passover comes on the 14th of Nisan, that is, on the first full moon after the vernal equinox.

Because Christ celebrated Passover



☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



just before the Crucifixion, the Christian Easter has always had a close connection with Passover. In the year 325 A.D. the Council of Nicaea met, and set the rules still used to determine Easter. Before that time there had been some controversy as to whether Easter should be celebrated at the same time as Passover, or on a Sunday, and the latter side won.

As the vernal equinox then came on March 21, it was decided that Easter should be the Sunday following the first full moon on or after March 21. Thus, the earliest that Easter can possibly occur is March 22, which happened last in 1818. Then the moon was full on March 21, which was a Saturday, so the next day was Easter Sunday. In 1845, 1856 and 1913, it came on March 23.

This year the sun actually crosses the equator on March 20 at 1:24 p.m., eastern standard time. That marks the official beginning of spring, but the ecclesiastical equinox comes, as always, on the 21st, which is Thursday. The moon is full on Saturday, the 23rd, so Easter Sunday is March 24, an unusually early date. Not again this century will it come so early, though in 1951 it will fall on the 25th of March.

Perhaps, by then, there will be a fixed Easter. With so many things depending on Easter, the shifting back and forth is very confusing, and it has been suggested that a fixed time, say the second Sunday in April, be set to celebrate it. There seems to be no essential religious objection, for the date of Christmas once wandered about until it was fixed a long time ago on December 25. In England, as a matter of fact, a law was passed by Parliament more than a decade ago fixing Easter, though it does not take effect until other nations have agreed to do likewise. We hope that, before many years have passed, it will be possible to get sufficient agreement between the nations of the world that such a decision may be made.

Celestial Time Table for March

Friday, March 1, 9:22 p.m., Algol at minimum. **Monday, March 4,** 6:11 p.m., Algol at minimum. **Friday, March 8,** 9:00 a.m., Venus passes Saturn; 9:23 p.m., New moon; 12:00 p.m., Moon farthest: 252,600 miles away. **Monday, March 11,** 3:25 a.m., Moon passes Jupiter. **Tuesday, March 12,** 9:01 a.m., Moon passes Saturn; 5:47 p.m., Moon passes Venus. **Wednesday, March 13,** 6:41 p.m., Moon passes Mars; 10:06 p.m., Moon passes Uranus. **Thursday, March 14,** 4:00 p.m., Neptune nearest; 2,716,000,000 miles away. **Saturday, March 16,** 1:00 p.m., Mars passes Uranus; 10:25 p.m., Moon at first quarter. **Tuesday, March 19,** 2:17 a.m., Algol at minimum. **Wednesday, March 20,** 1:24 p.m., Sun crosses equator; spring commences. **Thursday, March 21,** 1:07 a.m., Algol at minimum. **Saturday, March 23,** 5:00 a.m., Moon nearest; 221,900 miles away; 1:33 p.m., Full moon. **Sunday, March 24,** 7:56 p.m., Algol at minimum. **Tuesday, March 26,** 9:00 a.m., Venus passes Uranus. **Saturday, March 30,** 11:20 a.m., Moon in last quarter.

Eastern Standard Time throughout.

Science News Letter, February 24, 1940

MEDICINE

Hail Reopening of Popular Medical Exhibits

THE REOPENING on May 11 of the popular medical and public health exhibits of the N. Y. World's Fair, announced by Dr. Louis I. Dublin, acting chairman of the American Museum of Health, is being hailed by lay people and medical and health authorities.

The exhibit last year "gave to several million people from the United States, Canada and elsewhere valuable, life-saving knowledge," Surgeon General Thomas Parran, U. S. Public Health Service, declared in a letter to Dr. Dublin.

The federal health service cooperated with the American Museum of Health in a visitor reaction study which showed that visitors to the medical and health exhibits gained from them vitally useful knowledge of health and medical matters.

New exhibits, to be announced later, will be added to the Carrel-Lindbergh "heart," the Transparent Man and other dramatic exhibits which last year vied in popularity with such industrial features as the General Motors Futurama and the American Telephone and Telegraph Company's Voder. The medical and public health exhibits last year drew a record-breaking attendance of 7,500,000 visitors, approximately one out of every three World's Fair visitors, and more by 2,000,000 than the total attendance of any previous public exhibit of medicine and public health anywhere in the world.

Science News Letter, February 24, 1940

The world's smallest known flowering plant is watermeal, about one thirty-second of an inch in diameter.

A Chinese cast-iron stove more than 1,700 years old, exhibited at the Field Museum, has a chimney and five cooking holes on top.

Mr Tompkins in Wonderland

by G. GAMOW

$2

Have you met Mr Tompkins? Timid Mr Tompkins who has fantastic adventures in worlds of quantum and relativity, where sometimes the world is only 30 feet across, and sometimes the speed of light is only ten miles an hour.

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NO SPINNING

Out of raw wood chips of spruce comes a new synthetic fabric which finds use in throw-away pillow cases, aprons and curtains. Special chemical treatments turns raw cellulose into a fabric which is basically white paper but which is tough, soft and feels like cloth.

From Page 119

erties, could be combined with an acid derived from castor oil. And out of this strange combination, said the famous Carothers' patent, could be made a fine, elastic and strong fiber suitable for stockings that would rival silk.

In actual practice and on a commercial scale du Pont chemists, it should be understood, will do no grave-robbing to get their basic materials. Instead they will obtain their chemicals out of the great supplies of coal and from air and from water. Whether they will use the cadaverin method, described by Dr. Carothers, or some of the other seven methods he outlined is a matter now being worked out in experimental fashion.

The price of nylon hose, which will be available to the public very soon, will be comparable with superior silk stockings. It is expected that they will gain sales by having better wearing qualities with a sheer appearance.

Still newer as a chemical fiber marvel is the plastic resin known to the trade as Vinyon, which has been developed recently by scientists of the Carbide and Carbon Chemicals Corp. Made basically from salt, coal, lime and air this material is polyvinyl acetal resin. High-molecular weight compounds are created, from the raw materials, that are water-clear and can be spun into fibers comparable to nylon in physical properties.

Besides the hosiery field, Vinyon can also be used to make waterproof clothing, bathing suits, fireproof awnings with a silk-like appearance, fish lines and fishing nets, acid and alkali-resistant clothing, electrical insulation and shower curtains.

One of Vinyon's most striking uses is in the production of felt materials which contain no hair, or fur, or wool. Felts that look, feel and wear like the ordinary kind are now being made from cotton, thanks to the remarkable binding properties of Vinyon resins.

The marvels of chemistry may now make it possible to produce rivals for silk from coal, tar and air—and for wool from cow's milk—but no one has yet managed to make a synthetic rival for cotton. Yet old King Cotton is by no means a senile old gentleman in the inventive sense.

In fact even while man-made silk from coal, air and water has been getting the headlines because it may seriously reduce Japan's silk exports to the United States, new experimental cotton stockings have been making their appearance on the women of the U. S. Department of Agriculture's Bureau of Home Economics in Washington, who are giving them their wearing tests.

These new stockings, outgrowth of scientific ingenuity, are still another competitor in the highly lucrative market of women's hose. Cotton they are, in basic material, but they have overcome the long time bugaboo of cotton stockings; the poor fit and non-snugness that leaves telltale wrinkles on the ankles of the wearer. Also the new hose—not yet on the market—have a sheerness which one would not have believed possible.

Made on the same machines that weave ordinary silk stockings the new cotton hose promise increased use of America's huge cotton surplus.

Smart salesmanship by the U.S.D.A. experts says frankly that cotton hose do not rival silk stockings in appearance but goes on to add quickly, "You wouldn't wear your silk evening dress to play golf, would you? Then why wear sheer, evening weight hose on the golf course or in the garden?"

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● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Wednesday, Feb. 7, 12:16 p.m., EST.

Near Attu island (Aleutians). Latitude 53 degrees north, longitude 174 degrees east. Severe shock.

Stations cooperating with Science Service in reporting earthquakes recorded on their seismographs are:

University of Alaska, College, Alaska; Apia Observatory, Apia, Western Samoa; University of California, Berkeley, Calif.; Dominion Observatory, Ottawa; Dominion Astrophysical Observatory, Victoria, B. C.; The Franklin Institute, Philadelphia; Harvard University Observatory, Harvard, Mass.; University of Hawaii, Honolulu; Hong Kong Observatory, Hong Kong, China; Magnetic Observatory of the Carnegie Institution of Washington, Huancayo, Peru; Massachusetts Institute of Technology, East Machias, Maine; University of Michigan, Ann Arbor, Mich.; Manila Observatory, Manila, P. I.; Montana School of Mines, Butte, Mont.; Montana State College, Bozeman, Mont.; Nebraska Wesleyan University, Lincoln, Neb.; Pennsylvania State College, State College, Pa.; Phu Lien Observatory, near Hanoi, French Indo-China; Seismological Observatory, Pasadena, Calif.; University of South Carolina, Columbia, S. C.; U. S. Weather Bureau, University of Chicago; Utah Agricultural College, Logan, Utah; Williams College, Williamstown, Mass.; University of Wisconsin, Madison, Wis.; Zikawei Observatory, near Shanghai, China; observatories of the Jesuit Seismological Association at Canisius College, Buffalo, N. Y., Fordham University, New York City, Georgetown University, Washington, D. C., St. Louis University, St. Louis, St. Xavier College, Cincinnati, and Weston College, Weston, Mass.; observatories of the U. S. Coast and Geodetic Survey at San Juan, P. R., Sitka, Alaska, Tucson, Ariz., and Ukiah, Calif.

shades the government people offer the alternative stocking for sports; a cotton stocking that will give long wear plus good looks. Women are becoming more sensible, reason the U.S.D.A. experts, and are coming to realize that dance floor hosiery styles offer all too little for the average housewife when viewed in the light of the dent put in the household budget by the item of stockings.

Most synthetic fibers and fabrics have their birthplace in chemical laboratories but one of the most recent came out of a bathtub.

This new fabric, created by two advertising men turned inventors, is called Pervel. Like rayon Pervel comes from the cellulose of trees but with this similarity the comparison stops, for Pervel contains no threads and is essentially paper. Yet it is paper so strong that it can be used wet without breaking, but so soft and flexible that it feels and looks like cloth.

Like many a man before them the two inventors, Francis DeWitt and Paul Bryant, dreamed of a cloth that could be made so cheaply it would be thrown away instead of being sent to the laundry for cleaning.

Out of months of bathtub research in their New York apartments came a hint at what was needed. With cellulose wood pulp and chemicals they concocted sticky drab materials that hung over the shower curtains to dry.

Balked finally, they took their problems to the chemists of a Maine paper company. There it was found possible to press the cellulose fibers in sheets of material that could be properly "weighted" to add body, strength and beauty to the finished product. Lime, sulfur, leaching solutions and acids are only a few of the chemicals used in the new method.

This new fabric is unique, for while it contains cellulose the cellulose fibers are not spun into threads and then woven into cloth. The cellulose is simply pressed flat. Pervel, by avoiding the spinning and weaving stages, arrives in the finished fabric form with a great economy. That explains why you can buy a pillow case, an apron or bed sheets of this new material for but little more than it costs to send cotton ones to the laundry.

On the list of Pervel products today are aprons, curtains, table and bed linen, handkerchiefs and scores of other products where a "throwaway" principle can apply.

There is one other unusual material now finding a steadily increasing use in modern clothing. It is the milky white sap of the tropical tree that man calls rubber when it is hardened and properly processed.

The dark-skinned natives of the Dutch East Indies probably never wear bathing suits but the rubber they produce now finds wide use for just this purpose through lastex fabrics.

Clothing of this material literally covers the figure with slender, tiny rubber bands which are skillfully wrapped round with coverings of silk, cotton or linen so that the resulting cloth resembles, in appearance, its covering rather than the inner rubber core.

Makers of girdles and other foundation garments for women were quick to realize the worth of this new advance. Now lastex fabrics have come out into the open and appear not only in clinging form-shaping (and revealing) bathing suits but also in many articles of clothing where snugness is desired. Just as one example, lastex riding breeches solve the problem of having snugness at the knees without binding. Claim of this elastic fiber is that for the first time since Adam killed an animal and used its skin for clothing, man has at last achieved a fabric that will hug the figure and not hang in folds.

Science News Letter, February 24, 1940

About 250,000 miles of rural roads are cleared of snow by state and county highway departments.

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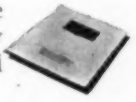

POLAROID CORPORATION

719 Main Street Cambridge, Mass.

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PSYCHOLOGY

Propaganda in Europe Less Effective Than World War's

This is an authoritative article prepared by the Society for the Psychological Study of Social Issues for release through Science Service. Such articles present results of current research on propaganda and war.

PROPAGANDA in the present war is "a distinct disappointment to the students of propaganda," says Prof. Ralph H. Lutz of Stanford University, one of the outstanding historians of the World War and author of several studies of World War propaganda techniques.

Prof. Lutz, who is director of the Hoover Library on War, Revolution and Peace, has just returned to his post at Stanford University from a seven-months' trip through Europe, during which he visited all the belligerent and most of the neutral countries.

He was in Russia when Russia was whipping up popular fury against the Finns, in Germany both before and after Hitler marched against Poland; he stood with Raemaekers, the celebrated Dutch artist-propagandist of the first World War, watching troops march in Amsterdam. Nowhere did he find the rousing of effective war attitudes as successful as it was 25 years ago.

"One reason for the disappointment of propaganda in the present war," Prof. Lutz reported on his return to America, "is that 'name-calling' had been so thoroughly developed by early summer that it lost its effectiveness as the crisis heightened. The people have become so well-conditioned that enemy propaganda is ineffective."

Underground channels of communication are working full time in every belligerent country Prof. Lutz said. Listening to forbidden enemy broadcasts is seemingly impossible to prevent. He told of one German who remarked to him, "I dreamed last night that Chamberlain made an announcement of his policies."

"That's funny," Prof. Lutz replied, "I heard the announcement over the radio at the American consulate."

Arrangements for the collection of propaganda and other categories of historical materials bearing on the present war were completed by Prof. Lutz during his seven months' European stay. The powerful name of the Hoover Library is a magnet to European collectors, accustomed to regard it as one of the leading storehouses for World War records. In particular, the Library will have, following the war and barring their destruction between now and then, outstanding collections on Fascism in Italy and Nazism in Germany.

A survey of the materials in the Library reveals how important a role propaganda played in winning the war for the Allies. A handbill, distributed by the officers to the men of the 18th German Army in September, 1918, testifies to the power of Allied pamphlets as psychological weapons:

"The enemy has defeated us not as man against man in the field of battle, bayonet against bayonet. No, bad contents in poor printing on poor paper has made our arm lame."

And a month later, this from a high officer of the German Army on the Western Front to a German newspaper back home: "What caused the most damage was the paper war waged by our enemies who daily flooded us with hundreds of thousands of leaflets, extraordinarily well arranged and edited."

Part of the effectiveness of the Allied propaganda lay in its purely informative character. Some of the leaflets gave accurate accounts of the food situation in Germany, of the arrival of American troops in France, of the advances made in certain sectors, including the number of casualties and prisoners. To the extent that the German officials had attempted to conceal these facts, actual information (at least some of which was known to be true) had the desired effect of producing distrust of the German officers and government. If the odds had not in fact been against Germany, such propaganda might not have been successful.

Although it has been estimated that the war was shortened by at least a year through the success of the propaganda it cannot be assumed that the effect was due solely to the cleverness of the propagandists. In addition to informative propaganda, much of the material was devoted to creating an atmosphere of despair with respect to the possibility of a German victory, and to creating hope for a satisfactory peaceful settlement of the war.

A strong feature of the later propaganda of the Allies was the idealism of Woodrow Wilson. This was effective both in building Allied morale and in breaking German morale through the hope which Wilson held out for welcoming a democratic Germany among the society of nations in a peace without victory.

Science News Letter, February 24, 1940

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PSYCHOLOGY—SOCIOLOGY

War Propaganda Wanted For Research Collection

PROPAGANDA wanted! If your morning mail contains a chain letter of propaganda for one of the warring nations or if you are handed a handbill or a leaflet, don't wad it up and throw it into the wastebasket.

It will be welcomed at the new "Propaganda and Promotion Archives" of the Carnegie Library, Washington and Lee University, Lexington, Virginia. A collection of such propaganda documents is being gathered there by Foster Mohrhardt, librarian of the university, and Prof. O. W. Riegel, director of the Lee Journalism Foundation at Washington and Lee. The archives will be available to present and future historians and students of propaganda methods.

"Libraries customarily receive a certain amount of such material," said Mr. Mohrhardt in requesting cooperation in building up his unusual collection, "but as far as I know, little systematic effort is made to collect all of the documents available. In addition to the more elaborate or formal pieces of propaganda, there are many types of fugitive material, such as posters, handbills, cartoons, chain letters and leaflets, which can only be preserved with the cooperation of persons who happen to receive them.

"We are particularly interested in the propaganda of foreign governments and of their agencies in this country. Persons who receive such material can perform an important service both to the university and to future historians and

students of propaganda by sending the material to us."

At the beginning of the present European war, requests for propaganda were sent to the various belligerents and they have cooperated by sending it. Other material has already been collected by Mr. Mohrhardt and by Prof. Riegel and his students of propaganda.

Science News Letter, February 24, 1940

METEOROLOGY

Strange Font of Type Speeds Weather Reports

BECAUSE weather information must be speeded into print in the least possible time, one of the world's strangest fonts of type is used in the U. S. Weather Bureau's central bureau, Washington.

Not more than about 200 different words are used ordinarily in the forecast. It is possible to set the forecast in type a word or more at a time rather than letter by letter. Familiar words in the daily weather forecast, and in some cases several words, are cast as one unit of type. Temperature . . . light snow . . . mostly southeast . . . slowly rising . . . colder . . . rain and warmer . . . moderate winds . . . these are some of the words and phrases carried on one piece of type to appear on the daily weather map, official record behind the widespread distribution of the daily weather forecast to newspapers and radio.

Science News Letter, February 24, 1940

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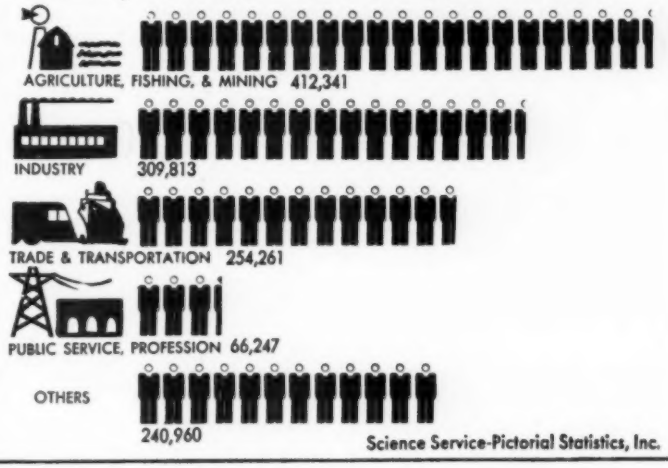

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MEDICINE

Insulin Helps Patients with One Type Digestive Disorder

PATIENTS with a certain type of gastro-intestinal disease have been helped by doses of insulin, the diabetes remedy, Dr. William J. Mallory, professor of medicine at George Washington University School of Medicine, announced at the school's annual Post Graduate Clinic.

He described the case of a patient with chronic dilatation of the stomach, with excess secretion of gastric juice but no obstruction, who was permanently relieved of his trouble by this hormone treatment.

The insulin achieves its effect by improving the muscle tone of the stomach and intestinal tract and stimulating peristalsis, Dr. Mallory explained. It is used for patients who, sometimes because of a nervous condition and sometimes following surgical operations, suffer from a paralysis of the digestive tract. The condition is not extremely common but neither is it rare. Once the relaxed stomach and intestinal tract have been stimulated to normal constriction and peristaltic movement, the insulin doses can be stopped.

In a general discussion of modern treatment of internal diseases, including specific serum treatment, chemical treatment and hormone treatment, Dr. Mallory said that the hormone treatment, when it can be used, may be considered the most scientific because it is physiological, "supplying some known deficiency, augmenting some action that is inadequate, or initiating some function that is in abeyance."

Science News Letter, February 24, 1940

Plant Experiments
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•First Glances at New Books

General Science

YEAR BOOK No. 38, July 1, 1938— June 30, 1939—*Carnegie Institution of Washington,* 384 p., Cloth, $1.50; paper, $1. The report of research by far flung laboratories of a great scientific institution, this is a veritable progress report on current science. Dr. Vannevar Bush writes his first annual report as president, with emphasis upon the emergency created by the fact that much of the world is at war.

Science News Letter, February 24, 1940

Philosophy—Mathematics

PORTRAITS OF FAMOUS PHILOSOPHERS WHO WERE ALSO MATHEMATICIANS, With Biographical Accounts—Cassius Jackson Keyser—*Scripta Mathematica,* $3. A portfolio of splendidly reproduced portraits and competently-written biographies of a dozen philosopher-mathematicians. For 6 cents postage Scripta Mathematica, Yeshiva College, 186th St. and Amsterdam Ave., New York City, will send the Pythagoras portrait and biography.

Science News Letter, February 24, 1940

Physiography

WORKBOOK AND LABORATORY MANUAL IN EARTH SCIENCE (PHYSIOGRAPHY)—Donald B. Stone; Edward S. C. Smith, ed.—*College Entrance Book Co.,* 278 p., 96 c. Price correction.

Science News Letter, February 24, 1940

Ornithology

THE AUTOBIOGRAPHY OF AN EGRET—E. A. McIlhenny—*Hastings House,* 57 p., $2. A beautiful and dignified bird condescends to speak to humans in their own language, telling realistically the story of his life. His account of his first experiences as a father is especially interesting—and amusing. The photographic illustrations are astonishing both for their beauty and their revelations of details of egret natural history.

Science News Letter, February 24, 1940

Mathematics

FIRST YEAR COLLEGE MATHEMATICS—Louis C. Plant and Theodore R. Running—*American Book Co.,* 424 p., $2.75. Freshman math with the elements of algebra, analytical geometry, trigonometry and calculus.

Science News Letter, February 24, 1940

Chemistry

YOUNG CHEMISTS AND GREAT DISCOVERIES—James Kendall—*Appleton-Century,* 272 p., $2.75. Prof. Kendall, now at the University of Edinburgh and former professor at New York University, has a pleasing manner of writing which makes good reading any book on chemistry which he attempts. In this book for boys and girls—and their parents too—is developed the concept that many of science's greatest successes are achieved by young men. Starting with Humphrey Davy and Michael Faraday, Prof. Kendall progresses to more modern figures in his fascinating book.

Science News Letter, February 24, 1940

Political Science

CLIPPERS AND CONSULS—Eldon Griffin—*Edwards Brothers,* 533 p., $10. American consular and commercial relations with Eastern Asia, 1845-1860. This volume lately received the Pacific History Award.

Science News Letter, February 24, 1940

Geography

ENVIRONMENT AND CONFLICT IN EUROPE—*American Geographical Soc.,* 26 p., 18 maps, $1. (Special Pub. No. 24) Reasons for economic, political, and military conflict between nations are shown in a series of maps all on one large sheet. Subjects include density of population, routes to the east, languages, navigable waterways. Notes and index accompany the maps.

Science News Letter, February 24, 1940

Horticulture

GARDENING FOR FUN, HEALTH AND MONEY—A. Frederick Collins—*Appleton-Century,* 297 p., $2. An elementary book for beginning gardeners, which nevertheless undertakes to give a sound scientific understanding of the principles underlying the practices of the art.

Science News Letter, February 24, 1940

Geology

THE DEVONIAN OF PENNSYLVANIA—Bradford Willard, Frank M. Swartz and Arthur B. Cleaves—*Pa. Bureau of Publications, Dept. of Property & Supplies, Harrisburg, Pa.,* 481 p., $3. Detailed description of a highly important group of geological formations, in one of the most geologically interesting of the states.

Science News Letter, February 24, 1940

Medicine

THE VITAMINS; A Symposium—*American Medical Association,* 637 p., $1.50. A technical discussion, by authorities, which will help busy practicing physicians and nutritionists in their efforts to keep abreast with the rapid growth of knowledge in the vitamin field.

Science News Letter, February 24, 1940

Industry

PACKAGING CATALOG 1940—Edited by A. Q. Maisel—*Breskin Publishing Co.* 538 p., $2.50. One of the most effectively printed books in any field is this 12th annual encyclopedia of the packaging industries. There are dozens of inserts and samples of fancy papers, ribbons, labels, wraps, ties, in this 6 pound package. Its cover is lithographed in seven colors directly on canvas overlaid by a transparent thermoplastic protective coat.

Science News Letter, February 24, 1940

Archaeology

EARLY POTTERY OF THE JEBELEH REGION—Ann M. H. Ehrich—*American Philosophical Society,* 129 p., $2.

Science News Letter, February 24, 1940

History

CALABRIA, The First Italy—Gertrude Slaughter—*Univ. of Wisconsin Press,* 330 p., $4. The toe of the boot was the first Italy, and if it is less familiar than some Italian regions, it is perhaps all the more attractive as a book subject. Miss Slaughter features its famous people, from Pythagoras down to the seventeenth century painter known as the Calabrian Knight.

Science News Letter, February 24, 1940

Medicine

ROENTGEN TECHNIQUE — Clyde McNeill—*C. C. Thomas,* 315 p., $5. A technical book for specialists in X-ray work. The many double illustrations, consisting of a photograph of a person in position for X-ray pictures with a corresponding anatomical drawing of the part of the body to be X-rayed, should be especially useful.

Science News Letter, February 24, 1940

History

GUATEMALA, Past and Present—Chester Lloyd Jones—*Univ. of Minn. Press,* 420 p., $5. One of the leading Central American states, Guatemala is attracting considerable interest and this book is especially timely. It shows the development of modern Guatemala from the Conquest era, and gives comprehensive data on political, economic, and social conditions.

Science News Letter, February 24, 1940

Ethnology

THE BLACK POTTERY OF COYOTEPEC, OAXACA, MEXICO—Paul Van de Velde and Henriette Romelike Van de Velde—*Southwest Museum,* 42 p., 75c. (Southwest Museum Papers, No. 13)

Science News Letter, February 24, 1940